OBJECTIVES: To estimate productivity loss and associated indirect costs in working-age high-risk patients treated for hyperlipidemia who experience new cardiovascular (CV) events. **METHODS:** A retrospective population-based cohort study was conducted using Swedish electronic medical records linked to national health registers and the Social Insurance Register. Patients were included based on a prescription of lipid-lowering therapy between January 1, 2006 and December 31, 2011 and followed until December 31, 2012 for identification of CV events and estimation of work productivity loss (e.g. sick leave and disability pension) and indirect cost. Patients were stratified into two cohorts based on CV risk level. Propensity score matching was applied to compare patients with new events (cases) to patients without new events (controls). For all outcomes, the incremental effect estimate of a new CV event was the difference between cases and controls in the differences between the year before and the year after the cases' new event. **RESULTS:** The incremental effect estimate on mean indirect costs of sick leave was largest in the CV risk-equivalent (RE) cohort (n=2,946) at 38,395 SEK. The corresponding figure in the CV event history cohort (n=4,508) was 23,931 SEK. There was substantial variation in work productivity loss with regard to type of new CV event. Transient ischemic attack and percutaneous transluminal coronary angioplasty had no significant effect on indirect cost. Other types of CV events yielded a substantial incremental cost estimate, such as myocardial infarction (38,002 SEK), unstable angina (27,189 SEK) and most notably ischemic stroke at 61,500 SEK. New CV events did not have a significant impact on disability pension in either cohort. **CONCLUSIONS:** High indirect costs are related to work productivity losses associated with new CV events in high-risk patients treated for hyperlipidemia. The effect of new CV events on indirect costs varied by event type.

CV3
INCIDENCE DESCRIPTION AND COSTS OF ACUTE HEART FAILURE IN THE NETHERLANDS

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OBJECTIVES: Acute heart failure (AHF) is frequent, severe and costly, however detailed population-based epidemiological data are currently unavailable for the Netherlands. Our aim was to characterize the incidence, clinical features and outcomes of AHF, and estimate associated hospitalization costs in the Netherlands. **METHODS:** Using the 2010 Dutch Hospital Data (DHD), we identified all patients admitted to hospital with AHF as a primary diagnosis. DHD provide data on patient characteristics, primary diagnosis, date of admission and discharge, surgical procedures, prior location and discharge destination. We applied contemporary estimates of health care activity associated with AHF in order to calculate its cost in 2014. Major components of health care activity included in this estimate were hospital admissions associated with a primary diagnosis of AHF, associated drug utilization generally observed in those patients, major surgeries conducted during the hospital stay and autopsy associated with inhospital mortality. **RESULTS:** Primary analysis of the data identified 7,717 patients to be admitted at least once into Dutch hospitals in 2010 due to primary diagnosis of AHF. The mean age of patients was 77.1 (±11.5) and 51% were women. The most common comorbid conditions were cardiac dysrhythmias, essential hypertension, old myocardial infarction, other diseases of endocardium and diabetes. The mean hospital length of stay was 8.67 days during the first admission. Inhospital mortality was 11.3% and readmission to hospital was observed in 13.8% of the patients. Finally, the cost of an AHF hospitalization in the Netherlands was estimated to be €4,623. **CONCLUSIONS:** Our study provided important insights into the clinical characteristics and costs of AHF hospitalizations in the Netherlands. Further analysis including secondary diagnosis will indicate what the exact number of AHF hospitalizations is, and whether this resembles previously published figures from the National Institute for Public Health and the Environment of 29,838 patients hospitalized and diagnosed with congestive HF.

CV4
HEALTH UTILITY IN PATIENTS FOLLOWING CARDIOVASCULAR EVENTS

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OBJECTIVES: Cardiovascular (CV) disease is a major contributor to morbidity and mortality in the UK. Health-related quality of life (HRQoL) data is an important requirement of the development process and is used to inform the health state utilities within economic models. **METHODS:** EuroQol-5 dimension (EQ-5D) surveys were sent to patients (age ≥18 years) from three centres in the UK (Barnet, Cardiff, Peterborough) 1 month following hospital admission for a myocardial infarction (MI), unstable angina (UA) or stroke. Patient demographics, lifestyle and baseline utility score were collected in the first survey. Follow-up surveys were sent at 6, 12, 18 and 24 months capturing utility and subsequent health events. Descriptive statistics and general linear regression models were used to describe the patients and to identify changes in utility over time. **RESULTS:** 1350 patients (mean age 68.8 years; SD 12.3) were recruited. Of these, 755 (55.9%) suffered a MI, 571 (42.3%) had UA, and 24 (1.8%) had a stroke; 345 (25.6%) patients also had diabetes. Baseline utilities were 0.690 (SD 0.322) in patients with a MI and 0.623 (SD 0.322) in patients with UA. Using regression, mean utility was 0.767 (MI) and 0.724 (UA) at 1 month, changing to 0.846 (MI) and 0.807 (UA) at 6 months, 0.877 (MI) and 0.845 (UA) at 12 months, 0.855 (MI) and 0.841 (UA) at 18 months, and 0.885 (MI) and 0.836 (UA) at 24 months. Diabetes was associated with a decrement of 0.106, 0.046, 0.074, 0.076 and 0.059 at 1, 6, 12, 18 and 24 months, respectively. **CONCLUSIONS:** In this prospective, robustly conducted study with good follow up, HRQoL associated with CV events appeared to improve in the 6 months post-event. However, over the next 18 months HRQoL plateaued with little to no improvement in this time period. Diabetic patients had lower scores at each timepoint.

HEALTH SERVICES RESEARCH STUDIES

HS1
FOLLOW-UP AUTOANTIBODY TESTING AND HEALTH CARE UTILIZATION AMONG PATIENTS WITH (SUSTAINED) CELIAC DISEASE ACTIVITY IN THE NETHERLANDS

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OBJECTIVES: To examine follow-up of autoantibody testing and health care utilization among patients with (sustained) celiac disease. **METHODS:** From the PHARMO Database Network, patients with a positive autoantibody test for deamidated gliadin peptide (anti-DGP), endomysial (EMA) or tissue transglutaminase (anti-tTG) (period 1998-2011) were classified as celiac disease patients. The first positive test served as index date. For patients with ≥12 months follow-up, autoantibody tests in the year after index date were assessed. Patients with a second positive test, using the same cut-off, between 6-12 months after index date were classified as 'sustained celiac disease' patients and matched 1:1 on gender, birth year and year of index date to celiac disease patients without a second positive test. For these patients, health care utilization in 2012 was determined. **RESULTS:** 1,815 patients had at least one positive autoantibody test, of which anti-tTG was most common (86%). 1,724 patients had ≥12 months follow-up, of which 75% did not have any type of autoantibody test in the year after index date. 183 patients (11%) were classified as 'sustained celiac disease' patients. Of these, 63 were active in the database in 2012 and could be matched. The proportion of patients with at least one GP visit and/or hospitalization in 2012 was lower among sustained celiac disease patients: 76% and 14% vs. 83% and 24% for patients without sustained celiac disease. However, the mean (±SD) number of GP visits was higher among sustained celiac disease patients (4.3 ± 7.3 vs. 3.4 ± 3.5) as was the mean (±SD) number of outpatient drug dispensings (21.6 ± 96.3 vs.10.5 ± 17.5). **CONCLUSIONS:** This study shows limited follow-up autoantibody testing among patients with celiac disease and does not suggest higher health care utilization with sustained celiac disease. These findings are consistent with notion of patients managing the disease without engaging the health care system.

HS2
THE IMPACT OF DIFFERENT LEVELS OF CLINICAL PHARMACIST INTERVENTIONS ON THE THERAPEUTIC PLAN AND COST SAVING

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OBJECTIVES: To assess the impact of different levels of clinical pharmacy intervention (CPI) on therapeutic plan and cost saving through monitoring and follow-up of some medications (including 20% Human Albumin, Meropenem and Cefepime) over three separated months. **METHODS:** A prospective observational study. Includes three phases, first phase: NO-CPI. While the second phase: partial clinical pharmacy intervention (PCPI) in which the clinical pharmacist contacted physicians directly or indirectly by telephone and give suggestions without evidence based supported or follow up. And third phase: an effective clinical pharmacy intervention (ECPI) defined by direct contact between the clinical pharmacist and physician through daily round supported by evidence based and follow up for patients and physician's orders. **RESULTS:** The percentage of quantity saved of Human Albumin was 46.5% during PCPI and 76.7% in ECPI. Also, there was monthly cost saving by both PCPI and ECPI (4880 $ and 8052 $ respectively). This means that ECPI resulted in more increment in cost saving in comparison to PCPI (39.4%). For Meropenem, 47.7% of the dispensed quantity was saved by PCPI and 90% by ECPI. Likewise there was a significant cost saving per month that is 3052.4 $ for PCPI and 5799.5 $ for ECPI. Thereby 47.4% more cost saving resulted from ECPI. Regarding Cefepime, although both PCPI and ECPI reduced the dispensed quantity, interestingly PCPI saved more than ECPI (25% and 4.58% respectively). This could be due to the clinical pharmacist recommendation according to local antibiogram. **CONCLUSIONS:** CPI generally results in cost saving of therapeutic plan. ECPI can lead to more remarkable cost saving.

HS3
IMPACT OF MORBIDITY IN POPULATIONS OF NORTH LONDON CLINICAL COMMISSIONING GROUPS ON PATIENT ADMISSION RATES AND GP REFERRALS

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OBJECTIVES: To ascertain whether disease prevalence alone explains elective and non-elective patient admission rates, general practitioner (GP) referral rates and prescribing spends in 20 North London Clinical Commissioning Groups (CCGs). **METHODS:** Using information provided by National Health Service (NHS) England CCG Information packs and the NHS CCG Outcomes Tool, age and sex standardised elective and non-elective admissions rates, GP referral rates and average prescribing spends were extracted and compared to national averages and to the prevalence of 19 commonly occurring diseases available through the Outcomes Tool (2011). **RESULTS:** Of the 20 North London CCGs included in this analysis, 4 reported a higher non-elective admission rate (per 1,000 of the population) than the national average. For CCGs reporting a higher than average non-elective admission rate the disease prevalence was, on average, higher in only 6/19 diseases compared to those CCGs reporting lower than average non-elective rates. Four CCGs reported higher than national average elective admission rates (per 1,000 of the population); of these, the disease prevalence was, on average, higher in 13/19 diseases than CCGs reporting lower than average elective rates. Sixteen CCGs reported higher than national average GP referral rates, and in these CCGs 10/19 diseases had a higher prevalence compared to those CCGs reporting lower than average rates. No CCGs reported a higher than national average prescribing spend (£, per person, per 1,000). **CONCLUSIONS:** Disease prevalence appears to explain rates of elective admissions and GP referrals relatively well in North London CCGs compared to non-elective admission rates. Non-elective admissions commonly occur in emergency situations, thus making